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10/679,711	10/06/2003	Shoupu Chen	86558SHS	2889

7590 11/17/2006  
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EXAMINER

PATEL, JAYESH A

ART UNIT PAPER NUMBER

2635

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/679,711

Applicant(s)

CHEN ET AL.

Examiner

Jayesh A. Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892) \*
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) , Paper No(s)/Mail Date 10/06/03, 12/20/04.
- ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,7,9-12,18,20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Meron et al. (US 6950690) hereafter Meron.

US patent 6950690 is prior art with respect to this application by the virtue of its publication on Apr 27 2000 as WO00/22975. For convenience citations in this office actions are made to the US patent 6950690.

1. Regarding Claim 1, Meron discloses, A digital image processing method for real-time automatic abnormality detection of in vivo images, comprising the steps of: a) forming an examination bundlette of a patient that includes real-time captured in vivo images;(Col 6, lines 4-6) by generating a map (images) of the gastrointestinal tract. b) Processing the examination bundlette; (Col 6, Lines 11-18). c) Automatically detecting one or more abnormalities in the examination bundlette based on predetermined criteria for the patient;( Col 4, Lines 65-67 and Col 5,Lines 1-2) and d) signaling an alarm provided that the one or more abnormalities in the examination bundlette have been detected at (Col 6, Lines 11-18 and 61-64).

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2. Regarding Claim 7, Meron anticipates all the limitations of Claim 1 and further discloses, The method claimed in claim 1, wherein the step of automatically detecting the one or more abnormalities includes the steps of: c1) detecting parameters that are substantially different from a given geometric template of physical data as identified in the in vivo images at (Col 4, Lines 65-67). The temp, pressure and pH sensors detect the non-physical data.

3. Regarding Claim 9, Meron discloses all the limitations of claims 1 and 7. The phrase "geometric template formed by training a template according to the predetermined criteria" carries no weight since the specific method of producing the template is not part of the method claimed.

4. Regarding Claim 10, Meron anticipates all the limitations of claim 1. Meron further discloses, the method claimed in claim 1, wherein the step of signaling the alarm includes the steps of: d1) providing a communication channel to a remote site; and d2) sending the alarm to the remote site at (Col 6, Lines 24-30).

5. Regarding Claim 11, Meron anticipates all the limitations of claim 1. Meron further discloses, the method claimed in claim 1; wherein the step of signaling the alarm includes the steps of: d1) providing a communication channel to a local site; and d2) sending the alarm to the local site at (Col 1, Lines 48-67).

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6. Regarding Claim 12, Meron discloses, A digital image processing system for real-time automatic abnormality detection of in vivo images, comprising: a) A capsule 60 for forming an examination bundlette of a patient that includes real-time captured in vivo images at (Col 6, Lines 4-6). b) A data processor 66 for processing the examination bundlette at (Col 6, Lines 35-38) c) means for automatically detecting one or more abnormalities in the examination bundlette based on predetermined criteria for the patient; and d) means for signaling an alarm provided that the one or more abnormalities in the examination bundlette have been detected at (Col 6, Lines 4-18 and Lines 54-64).

7. Regarding Claim 18, Meron anticipates all the limitations of Claim 12 and further discloses means for detecting parameters that are substantially different from a given geometric template of physical data as identified in the in vivo images at (Col 4, Lines 65-67).

8. Regarding Claim 20, Meron anticipates all the limitations of claims 12 and 18. The phrase "geometric template formed by training a template according to the predetermined criteria" carries no weight for the reasons stated above with respect to Claim 9.

9. Regarding Claim 21, Meron anticipates all the limitations of Claim 12. Meron further discloses, the system claimed in claim 12, wherein the means for signaling the

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alarm further comprises: d1) means for providing a communication channel to a remote site; and d2) means for sending the alarm to the remote site at (Col 6, Lines 24-30).

**10.** Regarding Claim 22, Meron anticipates all the limitations of Claim 12. Meron further discloses, the means for signaling the alarm further comprises: d1) means for providing a communication channel to a local site; and d2) means for sending the alarm to the local site at (Col 1, Lines 48-67).

**11.** Regarding Claim 23, Meron discloses, An in vivo camera for employing real-time automatic abnormality detection of in vivo images, comprising: a) A capsule 60 for forming an examination bundle of a patient that includes real-time captured in vivo images at (Col 6, Lines 4-6). b) A data processor 66 for processing the examination bundle at (Col 6, Lines 35-38). c) Means for automatically detecting one or more abnormalities in the examination bundle based on predetermined criteria for the patient; and d) means for signaling an alarm provided that the one or more abnormalities in the examination bundle have been detected at (Col 6, Lines 4-18 and Lines 54-64).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meron in further view of Wortmann et al. (US 2003/0149680) hereafter Wortmann.

12. Regarding Claim 2, Meron anticipates all the limitations of Claim 1. Meron also discloses about forming an image packet of the real-time captured in vivo images of the patient in (Col 6, Lines 19-24). However Meron does not disclose forming patient's metadata and combining the image packet with the patient's metadata.

Wortmann discloses combining patient metadata with image data on Page 1 Para 0003 and 0005. The DICOM object format contains a header and image data. The header contains information such as patient's name, type of medical procedure or scan etc. The image data contains the pixel information. Wortmann uses DICOM (Digital Imaging and Communications in Medicine) protocol for communicating between two devices in the communications network. In such a network the medical staff can retrieve images by using Metadata information. The communication is configured for easy extraction of the patient data from the image database and helps in better media maintenance. The use of DICOM also allows data to be transformed into different form when transported. This limits the consumption of memory. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to use the DICOM protocol header as taught by Wortmann in the method and apparatus of capturing images of a lumen as taught by Meron.

13. Regarding Claim 13, Meron anticipates all the limitations of Claim 12. Meron also discloses about forming an image packet of the real-time captured in vivo images of the patient in (Col 6, Lines 19-24). However Meron does not disclose forming patient's metadata and combining the image packet with the patient's metadata.

Wortmann discloses combining patient metadata with image data on Page 1 Para 0003 and 0005. The DICOM object format contains a header and image data. The header contains information such as patient's name, type of medical procedure or scan etc. The image data contains the pixel information. Wortmann uses DICOM (Digital Imaging and Communications in Medicine) protocol for communicating between two devices in the communications network. In such a network the medical staff can retrieve images by using Metadata information. The communication is configured for easy extraction of the patient data from the image database and helps in better media maintenance. The use of DICOM also allows data to be transformed into different form when transported. This limits the consumption of memory. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to use the DICOM protocol header as taught by Wortmann in the method and apparatus of capturing images of a lumen as taught by Meron.

Claims 6,8,17,19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meron in further view of Zhang et al. (US 6181810) hereafter Zhang.



**14.** Regarding Claim 6, Meron anticipates all the limitations of Claim 1, however Meron does not disclose detecting the abnormality by threshold value of the pixels.

Zhang discloses detecting abnormalities by selecting the pixels that exceed the predetermined value at (Col 2, Lines 57-61). The pixel values above the threshold limit will have a binary value 1 and the pixel values below the threshold will have a binary value 0. This approach can enhance the edge between blood and tissue making error free diagnosis. Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the image enhancing techniques as taught by Zhang for detecting abnormality (presence of blood) in the device delivery at the pathology location used by Meron.

**15.** Regarding Claim 8, see explanation of claim 6. Zhang further discloses the given threshold is based on the statistical data according to the predetermined criteria in (Col 2, Lines 59-61).

**16.** Regarding Claim 17, Meron anticipates all the limitations of claim 12, however Meron does not disclose detecting the abnormality by threshold value of the pixels.

Zhang discloses detecting abnormalities by selecting the pixels that exceed the predetermined value at (Col 2, Lines 57-61). The pixel values above the threshold limit will have a binary value 1 and the pixel values below the threshold will have a binary value 0. This approach can enhance the edge between blood and tissue

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making error free diagnosis. Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made to incorporate the image enhancing techniques as taught by Zhang for detecting abnormality (presence of blood) in the method used by Meron.

17. Regarding Claim 19, see explanation of claim 17. Zhang further discloses a threshold based on statistical data according to the predetermined criteria in (Col 2, Lines 59-61).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meron in view of Christensen et al. (US 6243502) hereafter Christensen.

18. Regarding Claim 3, Meron anticipates all the limitations of the claim 1. Meron however does not disclose the steps of processing the examination bundle, that includes the steps of: b1) separating the in vivo images from the examination bundle; and b2) processing the in vivo images according to selected image processing methods.

Christensen discloses separating the header information from the image – description included in the original file prior to processing of the image by an editing package at (Col 2, Lines 64-67 and Col 3, Lines 1-15). There are lots of image editing techniques that delete the image description and the color interpretation of the image's pixel. It is important to save the original information. The image header contains the

original information regarding an image. Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made to include the extraction of image description/quality information prior to processing as taught by Christensen in the method performed by Meron. (at **Data processor 66**).

Claim 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meron in view of Christensen and in further view of Qian (US 6332033) hereafter Qian.

**19.** Regarding Claim 4 the claimed limitation of performing noise filtering is an extremely conventional process in all types of image processing. It is so common to perform noise filtering to achieve best results in image processing. Also Meron and Christensen discloses all the limitations of Claims 1 and 3, except the color space conversion of images from RGB space to generalized RGB space.

Qian discloses the color space conversion of images from RGB to (r, g) at (Col 3, Lines 37- 65 and Col 4, Lines 1-13). The color blue is redundant after the process of normalization. Also the chances of false detection of the pixels are greatly reduced by normalization process. The purpose of the conversion is to 1) Distinguish skin color from other objects of the image and 2) To detect skin tones irrespective of color of the person's skin which differ from person to person and differs for the same person under different lighting conditions. Therefore it would have been obvious for one of ordinary skill in the art, at the time the invention was made to incorporate the conversion/filter as

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taught by Qian in the methods of delivery and Image capture as taught by Meron and image quality maintenance as taught by Christensen for the above stated reasons.

**20.** Regarding Claim 5 see explanation of claim 4.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meron in view of Christensen.

**21.** Regarding Claim 14, Meron anticipates all the limitations of the claim 12. Meron however does not disclose the steps of processing the examination bundle, that includes the steps of: b1) separating the in vivo images from the examination bundle; and b2) processing the in vivo images according to selected image processing methods.

Christensen discloses separating the header information from the image – description included in the original file prior to processing of the image by an editing package at (Col 2, Lines 64-67 and Col 3, Lines 1-15). There are lots of image editing techniques that delete the image description and the color interpretation of the image's pixel. It is important to save the original information. The image header contains the original information regarding an image. Therefore it would have been obvious to one of ordinary skill in the art, at the time the invention was made to include the extraction of image description/quality information prior to processing as taught by Christensen in the method performed by Meron. (at **Data processor 66**).

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meron in view of Christensen and in further view of Qian.

**22.** Regarding Claims 15 the claimed limitation of performing noise filtering is an extremely conventional process in all types of image processing. It is so common to perform noise filtering to achieve best results in image processing. Also Meron and Christensen discloses all the limitations of Claims 12 and 14, except the color space conversion of images from RGB space to generalized RGB space.

Qian discloses the color space conversion of images from RGB to (r, g) at (Col 3, Lines 37- 65 and Col 4, Lines 1-13). The color blue is redundant after the process of normalization. Also the chances of false detection of the pixels are greatly reduced by normalization process. The purpose of the conversion is to 1) Distinguish skin color from other objects of the image and 2) To detect skin tones irrespective of color of the person's skin which differ from person to person and differs for the same person under different lighting conditions. Therefore it would have been obvious for one of ordinary skill in the art, at the time the invention was made to incorporate the conversion/filter as taught by Qian in the methods of delivery and Image capture as taught by Meron and image quality maintenance as taught by Christensen for the above stated reasons.

**23.** Regarding Claim 16 see the explanation of claim 15.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jayesh A. Patel whose telephone number is 571-270-1227. The examiner can normally be reached on M-F 7.00am to 4.30 pm (5-4-9).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin M. Lateef can be reached on 571-272-5026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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11/13/2006



**DANIEL SWERDLOW  
PRIMARY EXAMINER**